Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Wireless Operations in the 3650-3700 MHz Band	)	ET Docket No. 04-151
	)	
Rules for Wireless Broadband Services in the 3650-3700 MHz Band	)	WT Docket No. 05-96
	)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band	)	ET Docket No. 02-380
	)	
Amendment of the Commission's Rules With Regard to the 3650-3700 MHz Government Transfer Band	)	ET Docket No. 98-237

PETITION FOR RECONSIDERATION OF THE WIRELESS COMMUNCIATIONS ASSOCIATION INTERNATIONAL, INC.

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EXECUTIVE SUMMARY

The Wireless Communications Association International, Inc. ("WCA") concurs with the Commission that the 3650-3700 MHz band offers an excellent opportunity to meet the "clear need for additional spectrum for broadband use." WCA, however, fears that the novel regulatory regime adopted in the *Report and Order* will have the unintended consequence of deterring the investment necessary for wireless broadband offerings to thrive in this band. In particular, the interference protection components at the heart of the Commission's new non-exclusive licensing approach – the "contention-based protocol" requirement and mandatory registration of fixed and base stations with an obligation to avoid interference to new entrants – cannot assure operators they will be able to provide consumers with the quality of service ("QoS") necessary to meet the needs of emerging broadband applications that require high bandwidth and/or low latency, such as Voice over IP.

WCA urges the Commission to adopt a modified licensing regime – auctioning a 25 MHz block based on a Metropolitan Statistical Area/Rural Service Area basis to meet the growing demand for high QoS, while at the same time retaining the non-exclusive licensing regime for a 25 MHz block of spectrum, which can be readily accessed by those willing to accept the risks associated with non-exclusive operations.

In addition, the Commission should clarify that, with respect to spectrum subject to non-exclusive licensing, the *Report and Order* does not require that "industry" must agree upon a single "contention-based" protocol before the 3650-3700 MHz band can be utilized. While Wi-Fi devices using the IEEE 802.11 standard employ the Carrier Sense Multiple Access with Collision Avoidance, "listen before talk" protocol, WiMAX technologies based on the IEEE 802.16 standard utilize a different protocol to avoid interference among competing users. A mandated single protocol, assuming it is possible, would result in significant delay and foreclose use of the band for sometime. Further, such a requirement could deter equipment manufacturers from developing products acceptable for the US market, since no other administration imposes a single protocol requirement on this band. Such flexibility, however, may not prevent all forms of interference when protocols are not compatible with each other. In any event, no matter what protocol is used, the potentially unlimited number of users of this band under a non-exclusive licensing arrangement prevents service providers from offering the QoS that subscribers are increasingly demanding and that is necessary to compete in the marketplace. Thus, an exclusive-use licensing approach for a portion of the band will advance the public interest.

The Commission should also revisit the rights and obligations of non-exclusive licensees with respect to registered base stations. The Commission not only subjects established facilities to interference from newcomers, but appears to have imposed on those who are first to deploy an obligation to modify their facilities to accommodate newcomers. This formulation is not likely to give comfort to potential system operators that require interference protection.

In addition, the Commission should reconsider its decision not to allow spectrum leasing in the 3650-3700 MHz band and instead should permit spectrum manager leasing by licensees of all 3650-3700 MHz band spectrum and *de facto* transfer leasing by exclusive-use licensees.

Finally, the Commission should modify its rules governing protection of grandfathered Fixed Satellite Service ("FSS") to provide for third-party frequency coordination of point-to-point links within the 150 km radius FSS coordination zones in the same manner that successfully governs spectrum sharing under Part 101.

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PETITION FOR RECONSIDERATION

The Wireless Communications Association International, Inc. ("WCA"), by its attorneys and pursuant to Section 1.429 of the Commission's Rules, hereby petitions the Commission for reconsideration of the *Report and Order* in the above-captioned proceeding.[1]

I. INTRODUCTION.

With the *Report and Order*, the Commission has taken an important step towards resolving the long-running uncertainty over the 3650-3700 MHz band and freeing that spectrum for the provision of wireless broadband services. As the Commission correctly observes, there is "a clear need for additional spectrum for broadband use – including backhaul and subscriber connectivity" – and the 3650-3700 MHz band "appears to provide a unique opportunity to satisfy this demand."[2] Indeed, given that most of the world makes spectrum in the range of 3300-3700 MHz available for wireless broadband applications, this proceeding represents a particularly important opportunity for

[1] *Wireless Operations in the 3650-3700 MHz Band*, Report and Order and Memorandum Opinion and Order, 20 FCC Rcd 6502 (2005) ["*Report and Order*"].

[2] *Id.* at 6506.

the United States to harmonize its spectrum usage with global allocations and provide American consumers with the cost savings that come from the economies of scale inherent in a global market.

Unfortunately, WCA fears that the regulatory regime adopted for the 3650-3700 MHz band will have the unintended consequence of deterring the investment necessary for wireless broadband offerings to thrive in this band. In particular, the interference protection components at the heart of the Commission's new non-exclusive licensing regime – the "contention-based protocol" requirement and mandatory registration of fixed and base stations with an obligation to avoid interference to new entrants – cannot assure operators they will be able to provide consumers with the quality of service ("QoS") necessary to meet the needs of emerging broadband applications such as Voice over IP ("VoIP"). WCA urges the Commission to explore on reconsideration altering the rules to spur investment, such as providing for exclusive licensing of some of the 3650-3700 MHz band. WCA recognizes that reasonable people can disagree as to the best approach to utilizing exclusive licensing in the 3650-3700 MHz band, but suggests that auctioning a 25 MHz block on a Metropolitan Statistical Area ("MSA")/Rural Service Area ("RSA") basis could be the most efficient and effective way of meeting the growing demand for high QoS, while at the same time providing 25 MHz of spectrum that can readily be accessed by those willing to accept the risks associated with non-exclusive operations.

In addition, the Commission should reconsider its decision not to allow spectrum leasing in the 3650-3700 MHz band. Instead, it should permit spectrum manager leasing by all licensees in the 3650-3700 MHz band spectrum and *de facto* transfer leasing by exclusive-use licensees. Finally, the Commission should modify its rules governing protection of grandfathered Fixed Satellite Service ("FSS") to provide for third-party frequency coordination of terrestrial facilities

within the 150 km radius FSS coordination zones in the same manner that successfully governs spectrum sharing under Part 101.

II. DISCUSSION.

A. The Current Interference Protection Regime Will Not Spur Investment In The 3650-3700 MHz Band.

The *Report and Order* properly reflects that a wireless broadband service in the 3650-3700 MHz band will be of limited utility unless interference among users can be contained.[3] At the same time, however, the Commission has sought to provide a vehicle by which rural service providers can commence use of the band for the provision of wireless broadband services without significant barriers to entry.[4] Thus, the Commission has embraced a novel regulatory regime for the 3650-3700 MHz band that relies on the required use of "contention-based protocols" and mandatory registration of base stations to avoid interference among non-exclusive licensees in the band.[5] WCA applauds the creativity behind this approach but urges the Commission to reconsider it, as this regulatory regime will not accomplish the Commission's objectives for the band.

There is a palpable tension between the Commission's desire to make spectrum available with low barriers to entry and its recognition that interference avoidance is essential if the 3650-3700 MHz band is to serve as a viable home for wireless broadband services. The *Report and Order* attempts to have it both ways – allowing open entry while avoiding interference through the

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[3] *See, e.g.*, *id.* at 6508.

[4] *Id.* As will be discussed in more detail below, the Commission's conclusion that an exclusive licensing regime would not achieve this objective is incorrect. WCA believes that the Commission is fundamentally underestimating the demand for exclusively licensed spectrum, even in rural areas, for the provision of broadband services that require a high degree of QoS. *See infra* note 25. WCA's proposal on reconsideration addresses this concern by proposing that 25 MHz of the band be exclusively licensed, and by proposing that auction units be drawn along MSA/RSA boundaries so as to promote the ability of rural service providers to acquire rights that coincide with their service areas. This approach will provide an opportunity for those who desire high QoS to secure an exclusive license at reasonable cost (since the geographic licenses will be based on smaller areas more narrowly tailored to the needs of rural service providers), while those who are willing to accept the risks inherent in the use of non-exclusive spectrum will have a block available for their use.

[5] *See Report and Order*, 20 FCC Rcd at 6503; *id.* at 6519-20; *id.* at 6522-23.

mandatory use of "contention-based protocols" and registration of fixed and base stations. Upon closer examination, however, it becomes clear that neither of those requirements can assure that licensees in the band will be able to offer the QoS required to meet many marketplace demands. Further, the 3650-3700 MHz rules appear to obligate operators that have deployed facilities and are serving subscribers to subsequently modify their operations to avoid harmful interference to newcomers.[6] As a result, WCA fears that the new rules will serve as a deterrent to investment in the 3650-3700 MHz band, wasting a potentially valuable resource for the offering of wireless broadband services.

The *Report and Order* suggests that the risk of interference in this band is mitigated because the FSS coordination zones preclude usage for terrestrial applications in areas primarily on the two coasts, and thus "much of the interest in development of the band is focused on smaller markets and less densely populated areas of the US where there is less likelihood of congestion and interference."[7] While it is certainly true that FSS coordination will present challenges to operators in some parts of the country, it is likely that some terrestrial services will be provided over the 3650-3700 MHz band even within the FSS coordination zones. Moreover it is equally true that there are major urban areas that are well outside the FSS coordination zones, including Albuquerque, Atlanta, Austin, Boston, Chicago, Cleveland, Columbus, Detroit, Houston, Kansas City, Las Vegas, Milwaukee, New Orleans, Oklahoma City, Phoenix, San Antonio, and Tucson. Thus, WCA believes the Commission may be underestimating the importance of this band as a prospective source of wireless broadband for all Americans, not just those in rural areas.

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[6] *Id.* at 6512.

[7] *Id.* at 6513.

1. The "Contention-Based Protocol" Requirement Will Not Prevent Interference Among System Operators.

As noted above, a central component to the Commission's regulatory regime for the 3650-3700 MHz band is the obligation of non-exclusive licensees to employ a "contention-based protocol" in their technology of choice. At the outset, WCA notes that this requirement has resulted in confusion within the industry, and the Commission should provide clarity as to what obligations the "contention-based protocol" requirement imposes.[8] In the end, however, no matter how the Commission defines the obligation, WCA cannot agree that "the use of contention-based technologies will allow efficient use of this spectrum by multiple users without significant degradation of service."[9]

The Commission should clarify that the *Report and Order* does not require that "industry" must agree upon a single protocol before the 3650-3700 MHz band can be utilized. There is nothing in Section 90.7 (which defines "contention-based protocol"), Section 90.203(o)(1) (which obligates applications for equipment certification to describe the methodology used to meet the contention-based protocol requirement), or Section 90.1305 (which obligates stations in the band to utilize a contention-based protocol) to suggest that a single protocol must be agreed upon before the band can be utilized. To the contrary, the *Report and Order* rather clearly envisions that multiple protocols will be utilized, as it calls for the use of "some type of contention-based protocol" and leaves it to industry and standards bodies to establish appropriate "*protocols*."[10] Indeed, the *Report and Order* specifically identifies both the simple "listen before talk" protocol employed by Part 90 Private Land Mobile Radio Service operators and the somewhat more

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[8] WCA questions whether a "contention-based protocol" requirement should apply to any exclusive-use block adopted by the Commission on reconsideration, as the exclusive-use licensee has ample incentive to deploy technologies designed to minimize self-interference within its exclusive-use license area.

[9] *Report and Order*, 20 FCC Rcd at 6512.

[10] *See id.* at 6523-24 (emphasis added).

sophisticated Carrier Sense Multiple Access with Collision Avoidance ("CSMA/CA") protocol employed by Wi-Fi devices under the IEEE 802.11 standard as acceptable "contention-based protocols," while also making clear that WiMax technologies based upon the IEEE 802.16 standard can be introduced in the band, notwithstanding that this standard utilizes yet a third protocol for avoiding interference among competing users of the spectrum.[11]

Clarifying that the contention-based requirement does not compel a single protocol is critical to achieving the Commission's goal of rapid deployment in the band. As a practical matter, it is far from clear that a single protocol can be developed that will permit non-exclusive users operating over non-synchronized networks to share the spectrum without interference. While WCA certainly encourages reliance on evolving radio technologies where appropriate, there is no evidence that a single protocol is available at the present time or could be developed in short order that will permit an unlimited number of non-exclusive users operating on independent systems to utilize the band in a viable manner. Compounding the problem, the process of bringing all of the various "industry" parties interested in the band to a consensus would itself be contentious, to say the least.[12] At present there are technologies based upon IEEE 802.11, 802.16, 802.20 and proprietary approaches to spectrum sharing that all have the potential to use the 3650-3700 MHz band, and that all take different approaches to coexistence of multiple users within the band. Thus, delay would be inevitable if use of the band is foreclosed until a single protocol could be developed.

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[11] *See, e.g., id*. at 6523; *id.* at 6503 ("The licensing scheme that we adopt for this band will provide an opportunity for the introduction of a variety of new wireless broadband services and technologies, *such as WiMax*.") (emphasis added) (footnote omitted).

[12] If the Commission envisions a single protocol, then it should identify with specificity the standards body or other entity that will be responsible for developing that protocol. Given the disparate nature of the entities interested in using the 3650-3700 MHz band, it is not reasonable to expect that the entire industry will coalesce around a single protocol-setting effort.

Moreover, such a requirement could deter equipment manufacturers from developing products acceptable for the US market, since no other administration imposes a single protocol requirement on this band. Vendors may well conclude that they are better served by taking advantage of the economies of scale associated with the global market, rather than attempt to develop a specialized product for the US market. Again, it must be emphasized that the 3650-3700 MHz band is part of one of the few bands that have substantial international use for wireless broadband, and unique "US-only" rules ultimately will not redound to the benefit of US consumers.

While WCA advocates that licensees have the flexibility to select their technology of choice, in this instance such flexibility comes at a price. Because different protocols will take different approaches to sharing the band, they may not necessarily prevent all forms of interference, particularly when the protocols are not compatible with each other. For example, the "listen before talk" protocols specifically mentioned in the *Report and Order* can be problematic when deployed with respect to wide area services.[13] This is because while a Wi-Fi radio equipped with a CSMA/CA "contention-based protocol" may have the ability to accurately evaluate the radiofrequency environment around itself, it has no means of accurately evaluating the radiofrequency environment surrounding receivers (whether those receivers are part of a system using CSMA/CA or some other "contention-based protocol" like that used by 802.16) at distant

[13] A "listen before talk" approach tends to work well for short-range personal area networks and local area networks, where potential sources of interference are limited and are largely within control of the user. For example, a business that deploys a Wi-Fi network utilizing several wireless access points ("WAPs") can place those devices and adjust their power levels in a manner that minimizes interference. Or, a homeowner can locate his or her WAP so as not to be in the vicinity of a microwave oven. Because Wi-Fi was intended for short-range communications, it is unlikely that at any given location there will be sufficient number of non-coordinated users as to have a serious adverse impact on performance (save for situations where low latency is essential). However, as the spectrum is employed for wide-area or metropolitan-area networks that operate over longer distances, "listen before talk" is a less effective vehicle for controlling access among multiple users.

locations.[14] Indeed, as the Commission recognized in its recent *Report and Order* in the *Cognitive Radio* proceeding, the theory of smart radios capable of sensing their environment and reacting appropriately to avoid interference is ahead of the current state of technology.[15]

The IEEE 802.16 approach to controlling interference through allocation of time frames can be similarly problematic when used in the vicinity of a "listen before talk" protocol. Because a system operating pursuant to the IEEE 802.16 standard will only allocate time frames to its own users and to those users of other synchronized IEEE 802.16 systems, there is a clear risk that an IEEE 802.16 system will allow users to transmit at the same time as a nearby system based on the IEEE 802.11 standard. The result can be interference to one or both of the systems that utilize the same spectrum in the same area at the same time.

While this could be read to suggest that the Commission insist on a single standard, it does not. The fundamental problem WCA sees with the Commission's reliance on "contention-based protocols" to avoid interference is that no matter what protocol is used, the potentially unlimited number of users of this band under a non-exclusive licensing arrangement prevents service providers from offering the QoS that subscribers are increasingly demanding and that is necessary to compete in the broadband marketplace. Even a single protocol cannot assure that all users will be able to access the spectrum with the level of QoS required for a viable broadband service

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[14] When a long-range service is involved, the "hidden node" problem comes into play. The problem, simply stated, is that a given device can only "hear" those signals present at its own location, and not at the location of other receivers that may suffer interference when the device in question starts to transmit. For example, assume a wireless broadband service in which Subscriber A is transmitting to Base Station B. If Device X operates under a "listen before talk" protocol, it may not necessarily receive a signal from Subscriber A (who may have a directional antenna pointed towards Base Station B), but transmissions from Device X will cause interference at Base Station B. In other words, this particular contention-based protocol fails because the nature of the use does not assure that a transmitter can "hear" potential users of the spectrum at all locations where the transmissions are likely to be received.

[15] *See Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies*, ET Docket No. 03-108, Report and Order, FCC 05-57, at ¶ 13 (rel. Mar. 11, 2005). As Barron's magazine succinctly put it, "the truth is that Wi-Fi works best where users do not share spectrum." Hazlett, *The FCC Leaves Tomorrow's Promising Wireless Technologies on the Beach*, BARRON'S (Aug. 2, 2004) (*available at* <http://www.manhattan-institute.org/html/_barrons-missing_the_next.htm>).

offering capable of carrying evolving applications like VoIP that require high bandwidth and/or low latency. The Commission itself has recognized that "listen before talk" protocols such as those used by Wi-Fi devices "incorporate[] unpredictable delay as the transmitter waits until the channel is idle" and thus are "often not the best choice for time sensitive applications such as voice communications."[16] The same, however, would be true of a system that allocates time frames – with too many users in a given area, a given user will suffer such substantial delays between time frames that low-latency applications will be unable to ride over the broadband pipe. Thus, it would be no solution for the Commission to mandate that all systems utilize the IEEE 802.16 standard (and WCA is not suggesting that the Commission do so), and somehow require that all systems synchronize their timing so that no two users in the same geographic area are assigned the same spectrum at the same time. Even under such an approach, there will come a point at which so many users are attempting to access the spectrum that the gap between a given user's allocated time frames becomes too great to support applications requiring low latency, such as VoIP. The bottom line is this – contention-based protocols can help reduce interference among users by managing access to the spectrum, but they cannot guarantee that each of an unlimited number of non-exclusive users will experience the speed and latency levels necessary for a successful business.

Appropriately crafted, there may be little harm in requiring users of non-exclusive spectrum to employ some protocol to manage access to the spectrum, so long as that requirement affords flexibility in the selection of protocols and recognizes the inherent limitations of any protocol. Thus, on reconsideration the Commission should revise Section 90.7 to make clear that no one contention-based protocol is required of those using non-exclusive spectrum and that

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[16] *Report and Order*, 20 FCC Rcd at 6523.

protocols can only do so much to manage potential interference.[17] But that does not solve the underlying problem with the Commission's approach. The capacity pie can only be sliced so thinly, and coupling "contention-based protocols," facility registration and non-exclusive licensing does not prevent a "tragedy of the commons."

2. Fixed and Base Station Registration Does Not Entitle A Facility To Interference Protection and Established Operators Must Avoid Harmful Interference To Newcomers.

In addition to reliance on the "contention-based protocol" requirement, the *Report and Order* suggests that the mandate for registration of fixed and base stations will promote deployments in the 3650-3700 MHz band. WCA respectfully disagrees and believes, to the contrary, that the Commission should revisit the rights and obligations of non-exclusive licensees with respect to registered base stations.[18]

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[17] In refining the definition, the Commission should eliminate the requirement in Section 90.7 that an acceptable protocol "establish[] rules by which a transmitter provides reasonable opportunities for other transmitters to operate." The problem here is that no protocol can necessarily assure any transmitter a reasonable opportunity to transmit when there is no limit to the number of transmitters that are possible. For example, as noted above the Commission cites to the "listen before talk" protocol as being an acceptable contention-based protocol. One could certainly argue, however, that this protocol does not "ensure that all users have a reasonable opportunity to operate." To the contrary, this protocol is particularly vulnerable to the "tragedy of the commons" – as more users attempt to transmit on a given channel in a given area, it becomes more likely that any given user will be unable to gain access because the channel is constantly in use by some other user. And, the problem is arguably even worse with respect to the CSMA/CA protocol employed by Wi-Fi devices under the IEEE 802.11 standard. Since a Wi-Fi device imposes a backoff time if the device senses a busy channel, a given transmitter may never be able to access highly-congested spectrum. The problem is compounded when multiple protocols are permitted. For example, as noted, WiMax technologies mitigate interference by assigning each user a time frame for its transmissions. That approach works well, so long as there are not too many users and so long as all systems in a given area are synchronized so that multiple users do not receive conflicting time frame assignments. However, a time-allocation protocol simply cannot provide access to transmitters that are not synchronized.

For these reasons, WCA suggests that the references to "contention-based protocol" in Sections 90.203(o), 90.1305, 90.1319(b) be amended to require that licensees deploy a "coexistence protocol" and that the definition of "contention-based protocol" in Section 90.7 be revised as follows:

> *Coexistence protocol.* A protocol that allows multiple users to share the same spectrum in the same geographic area on a nearly real-time basis by separating in frequency domain and/or in time domain the available spectrum resource. No single protocol is required.

[18] On reconsideration, the Commission should clarify the provision of the *Report and Order* that provides that non-exclusive licensees must "delete registrations for unused fixed and base stations in order to maintain database integrity and facilitate efficient coordination between licensees." *Report and Order*, 20 FCC Rcd at 6516. Specifically, the Commission should amend Section 90.1307 to require the deletion of unused fixed and base stations registered by non-exclusive licensees. Moreover, to provide non-exclusive licensees with certainty and to

As with the "contention-based protocol" requirement, the registration rules do not provide non-exclusive licensees with sufficient certainty that they will be able to provide services with the QoS the marketplace demands. Throughout the *Report and Order*, the Commission consistently states that terrestrial licensees will not be entitled to interference protection.[19] That concept is reflected in newly-adopted Section 90.1319(c) of the Rules, which provides no interference protection to a given registered facility against those registered afterwards, but merely provides that "[l]icensees of stations suffering or causing harmful interference are expected to cooperate and resolve this problem by mutually satisfactory arrangements."[20]

This formulation is not likely to give comfort to potential system operators that require interference protection. Indeed, the Commission not only subjects established facilities to interference from newcomers, but appears to have imposed on those who are first to deploy an

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promote database consistency, the Commission should define the type and length of non-use that triggers the requirement for deletion of a fixed or base station operating in the non-exclusive block. WCA suggests that a station that is not used to provide actual service for a period in excess of 120 days should be deleted from the registry. This approach should provide sufficient opportunity for any post-registration testing of new facilities before commencement of service and for completing any maintenance or upgrades that require a temporary cessation of service.

Separately, the Commission should revise Section 90.1319(c) to require that a licensee registering a new fixed or base station must notify any licensee with a registered fixed or base station located within 50 miles of the newly-registered facility. This notification could be done by email, facsimile or regular mail using the contact information in the Universal Licensing System database. Such a requirement would provide incumbents with notice of new stations that might cause interference, without requiring incumbents to constantly monitor the database for new registrations.

[19] *See Report and Order*, 20 FCC Rcd at 6508-10.

[20] While the *Report and Order* consistently proclaims that non-exclusive licensees will have no interference protection from other non-exclusive licensees, it is difficult to square that concept with the requirement in Section 90.1319(c) that at the time of registration licensees examine the database of previously registered stations and "make every effort to ensure that their fixed and base stations operate at a location, and with technical parameters, that will minimize the potential to cause and receive interference." The concept of requiring spectrum users to make "every effort" to avoid interference to others is not defined and begs rather fundamental questions – does an existing system operator have a right of action against a newcomer that causes interference on the theory that the newcomer did not make "every effort" to prevent interference before registering its new fixed or base station? Is the "every effort" language to be read literally, imposing on newcomers the obligation to take whatever steps might be technically possible? Even if they are not economically feasible? Or, does the Commission really intend to apply some less protective standard (*e.g.*, commercially reasonable efforts, reasonable efforts, good faith efforts, etc.), or no standard whatsoever (*e.g.*, all terrestrial users are on equal footing)? To provide prospective licensees in the band with certainty and to avoid future disputes, the Commission should address these questions on reconsideration.

obligation to modify their facilities to accommodate newcomers.[21] At least in theory, a system operator could deploy a state-of-the-art network, develop a large subscriber base that highly values its service, and then be required to make network modifications to accommodate a newcomer. Suffice it to say that this is not likely to promote investment in the band.[22]

B. The Commission Should Provide For Exclusive-Use Licensing Of A Portion Of The 3650-3700 MHz Band.

1. Exclusive-Use Licensing Will Advance The Commission's Goal Of Promoting The Availability of Wireless Broadband Service.

WCA recognizes that the Commission's objective in this band is to provide a "streamlined licensing mechanism with minimal regulatory entry requirements that will encourage multiple entrants and stimulate the rapid expansion of wireless broadband services…."[23] While WCA agrees with those objectives, WCA submits that the best way to ensure wireless broadband investment is to provide for some exclusive-use licensing in the band. WCA appreciates that reasonable people can disagree as to how much spectrum should be made available for exclusive-use licensing, but suggests that the most effective approach may be to establish a 25 MHz block licensed through auction on an MSA/RSA basis and retain the non-exclusive licensing approach for the other 25 MHz block, regulated under the current rules (subject to the clarifications and revisions suggested by WCA herein).

As discussed above, the non-exclusive licensing regime adopted in the *Report and Order* does not assure that licensees can provide the QoS that the marketplace is increasingly demanding of broadband service providers. This concern over QoS is nothing new to this proceeding. Indeed,

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[21] *See Report and Order*, 20 FCC Rcd at 6512.

[22] While WCA is suggesting that some spectrum remain available for non-exclusive licensing, the Commission should on reconsideration address the degree to which a first mover is required to modify its operations to accommodate newcomers.

[23] *Report and Order*, 20 FCC Rcd at 6503.

the *Report and Order* acknowledges that "a number of parties, including WISPs, express concern about the risk that intense use of spectrum by a variety of devices under a traditional unlicensed approach could result in mutual interference, thereby reducing the utility of this band."[24] That is no surprise, as the record before the Commission consistently has shown that users of non-exclusive spectrum, even in more rural areas of the country, have an interest in securing access to exclusive-use spectrum to assure that they can meet marketplace demands.[25] This will be particularly true at 3650-3700 MHz given the recognized utility of this band to meet the need that rural service providers have for backhaul and operators' need for highly-reliable backhaul links.[26]

As such, WCA's proposal for exclusive-use licensing will advance the Commission's objective of promoting the availability of wireless broadband service in all markets, including rural communities.[27] The non-exclusive 25 MHz block will provide immediately available spectrum to

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[24] *Report and Order*, 20 FCC Rcd at 6507.

[25] For example, the National Telecommunications Cooperative Association ("NTCA") recently reported on the results of a survey of its members. NTCA noted:

> Though inexpensive and readily available, [unlicensed spectrum] is far from an ideal solution: 54% of those survey respondents utilizing unlicensed spectrum indicated they had experienced difficulties with interference. The perceived inferiority of unlicensed spectrum is best evidenced by the fact that survey respondents indicated that they would prefer access to additional licensed spectrum over additional unlicensed spectrum by a 69% to 31% margin.

Comments of National Telecommunications Cooperative Ass'n, GN Docket No. 04-163, at 3 (filed April 22, 2005) (footnote omitted). Similarly, Virginia Communications, Inc. ("VCI"), the owner of the CommSpeed service that provides wireless broadband in several rural communities, has reported to the Commission that:

> Over the past 3 years, VCI has deployed equipment utilizing both licensed and unlicensed spectrum. Our experience has been that, while unlicensed systems have required less advanced preparation compared with the engineering and licensing requirements of licensed systems, we have been able to provide more consistent and reliable service to our customers using licensed systems.

Comments of Virginia Communications, GN Docket No. 04-163, at 2 (filed June 2, 2004). By providing one exclusively-licensed band where quality of service can be assured, WCA's proposal will provide 3650-3700 MHz band users, including those rural Americans who today have little access to broadband, with the opportunity to enjoy VoIP and other applications that require low latency over wireless broadband.

[26] *See Report and Order*, 20 FCC Rcd at 6506.

[27] *Id.* at 6503-04.

any service provider willing to accept the risks associated with operating in non-exclusive spectrum. And, by auctioning the exclusive block based on the 734 MSAs and RSAs, rather than some larger geographic area, the Commission can assure that rural service providers have a meaningful opportunity to secure a license that is narrowly tailored to meet its needs.[28] As was recognized by the Spectrum Policy Task Force, "licensing areas that distinguish between rural and urban areas so that rural interests can more readily acquire spectrum in the areas they serve" may be appropriate.[29] WCA's approach embraces that concept.

2. Additional Service Rules Will Be Required To Reflect Exclusive-Use Licensing Of The 3650-3700 MHz Band.

To accomplish the objectives that WCA shares with the Commission for the 3650-3700 MHz band under a regulatory environment where one 25 MHz block of the band will be licensed, certain new and/or revised service rules will have to be adopted. WCA suggests the following:

a) Co-Channel Interference Protection

If the Commission adopts WCA's proposal for assigning exclusive MSA/RSA-based geographic licenses for a 25 MHz block through the auction process, it is essential that the Commission provide clarity as to the co-channel interference protection rights and obligations that will be imposed on exclusive licensees. WCA submits that the Commission's decision last year with respect to avoidance of co-channel interference in the 2.5 GHz band may prove instructive.

At a minimum, the Commission should do as it did in the *Report and Order* in WT Docket No. 03-66 (as well as a variety of other geographic licensing services) and impose upon exclusive-

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[28] This is firmly established by the record before the Commission in WT Docket No. 02-353, where support has evolved for the concept of making some new Advanced Wireless Service spectrum in the 1710-1755 and 2110-2155 MHz bands available on an MSA/RSA basis. *See, e.g.*, Letter of CTIA – The Wireless Association™, WT Docket No. 02-353, Attachment at 2 (filed Feb. 9, 2005); Letter of Organization for the Promotion and Advancement of Small Telecommunications Companies, WT Docket No. 02-353, at 1-2 (filed June 2, 2005); Letter of National Telecommunications Cooperative Ass'n, WT Docket No. 02-353, at 1-2 (filed May 25, 2005); Comments of the Rural Cellular Ass'n, WT Docket No. 02-353, at 3 (filed Feb. 7, 2003).

[29] *Report of the Spectrum Policy Task Force*, ET Docket No. 02-135, at 60 (rel. Nov. 15, 2002).

use licensees in 3650-3700 MHz band the obligation to restrict their signal strength at the boundary of their geographic service area. For the 2.5 GHz band, the Commission has required licensees to restrict their field strength at the boundary of their service area to 47 dBμV/m measured over 5.5 MHz bandwidth (*i.e.*, the bandwidth of most 2.5 GHz band channels), with operations over other bandwidths adjusted appropriately.[30] The Commission reasoned that:

> Imposing a signal strength maximum at a licensee's service area boundary is a tried and true mechanism for managing and limiting co-channel interference as well as defining rights, obligations and expectations of all licensees in the band. This boundary signal strength will also facilitate coordination between co-channel licensees in adjacent areas. Furthermore, . . . this limit is consistent with other signal limits for other similar services.[31]

With appropriate adjustment for propagation and bandwidth differences, WCA submits that the 2.5 GHz rule is an appropriate starting place for consideration of a 3650-3700 MHz band rule.

It may also be appropriate to consider adoption of a "height benchmarking" requirement for the licensed block similar to that adopted for the 2.5 GHz band. Because of the potential for non-synchronized base stations in adjacent markets to cause interference to each other notwithstanding compliance with the boundary field strength limit, the Commission adopted Section 27.1221 to provide additional interference protection to 2.5 GHz base stations where adjacent neighbors cannot agree on other coordination mechanisms.[32] A similar requirement could prove helpful in

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[30] *See Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd 14165, 14208 (2004) ["*2.5 GHz Report and Order*"]. Operations over different sized channels are adjusted by applying a factor of 10 log[(actual bandwidth MHz)/(5.5 MHz), and measurements are conducted 1.5 meters above ground. *Id.* at 14209-10. It should be noted that WCA has requested some ministerial edits to the rules implementing the co-channel interference protection requirement, and to the extent relevant, those revisions should be incorporated here. *See* Petition of Wireless Communications Ass'n Int'l for Partial Reconsideration, WT Docket No. 03-66, at 37-38 (filed Jan. 10, 2005) ["WCA 2.5 GHz Petition for Reconsideration"].

[31] *2.5 GHz Report and Order*, 19 FCC Rcd at 14208.

[32] *See id.* at 14213.

the exclusive-use block of the 3650-3700 MHz band, and should be given serious consideration by the Commission.[33]

b) Adjacent Channel Interference Protection

Along similar lines, adoption of WCA's proposal will require the adoption of spectral masks that will avoid interference from non-exclusive licensees to an adjacent channel exclusive licensee. Once again, WCA believes that the Commission's handling of this issue with respect to the 2.5 GHz band provides an appropriate starting point.[34] At present, the 2.5 GHz band rules are somewhat in a state of flux due to pending petitions for reconsideration, including a petition by WCA. For present purposes, suffice it to say that the Commission should consider requiring licensees in the non-exclusive channel block to comply with the spectral mask requirements adopted for the 2.5 GHz band, subject to the modifications proposed by WCA in its pending petition for reconsideration of the *Report and Order* in WT Docket No. 03-66.[35]

c) Performance Requirements

The *Report and Order* did not adopt any performance standard for non-exclusive licensees, recognizing that there was little regulatory benefit to be gained by requiring non-exclusive licensees to meet any particular benchmarks.[36] While WCA agrees with the Commission's rationale for not imposing any performance requirement on the non-exclusive block, the

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[33] Licensees in the non-exclusive block will be operating pursuant to nationwide licenses, and not smaller service areas. As such, a height benchmarking regime would be inapplicable, since the rights and obligations under height benchmarking are based upon the distance of a base station from the licensee's service area boundary with the neighbor that suffers or causes interference.

[34] *See 2.5 GHz Report and Order*, 19 FCC Rcd at 14215.

[35] WCA 2.5 GHz Petition for Reconsideration at 40-46. *See also* Consolidated Reply to Oppositions to Petition for Reconsideration of Wireless Communications Ass'n Int'l, WT Docket No. 03-66, at 16-18 (filed March 9, 2005).

[36] *See Report and Order*, 20 FCC Rcd at 6516.

Commission should adopt a performance requirement for those licensees that prevail in the auction for the exclusive-use spectrum.

More specifically, the Commission should require an exclusive-use licensee to demonstrate substantial service within five years of receiving its license for the 3650-3700 MHz band.[37] The Commission should define "substantial service" as it has always done, *i.e.*, as service "which is sound, favorable, and substantially above a level of mediocre service which just might minimally warrant renewal."[38] The application of this same definition to the 3650-3700 MHz band will permit the Commission to "consider such factors as whether the licensee is offering a specialized or technologically sophisticated service that does not require a high level of coverage to be of benefit to customers, and whether the licensee's operations serve niche markets or focus on serving populations outside of areas served by other licensees."[39] As the Commission recently noted in the *Rural Wireless Report and Order,* a substantial service requirement allows licensees "to develop construction plans that tailor the deployment of services to needs that are otherwise unmet, such as the provision of service to rural or niche markets."[40] In addition, it will permit the Commission to

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[37] WCA appreciates that in seeking a substantial service performance review only five years after licensing, it is breaking with the Commission's more common approach of evaluating performance at renewal, 10 years following licensing. WCA believes that this approach may be appropriate given the unusual circumstances here -- the extremely small size of the proposed service areas, the amount of spectrum covered by a license, and the fact that the band is cleared and immediately ready for deployment, save for those areas in the vicinity of FSS and government facilities.

[38] 47 C.F.R. § 27.14(a).

[39] *Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service ("WCS")*, Report and Order, 12 FCC Rcd 10785, 10844 (1997) ["*WCS R&O*"] (footnotes omitted).

[40] *Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies To Provide Spectrum-Based* Services, Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd 19078, 19121-22 (2004) ["*Rural Wireless R&O*"]. The Commission has also highlighted the benefits of the substantial service performance test in comparison to population build-out requirements, which may not serve rural interests. *See id.* ("[P]articularly in cases where a licensee has a population-based construction requirement, licensees have both an economic and practical incentive to achieve compliance with the Commission's build-out obligation by providing service to urban areas. Further, current population-specific benchmarks may have the unintended consequence of encouraging several licensees within a particular market to provide coverage to the same populous areas.") (footnotes omitted).

evaluate the impact of FSS protection zones on a given terrestrial licensee's ability to provide service. Equally important, the substantial service model promotes innovation in wireless services:

> [T]he types of service available from 39 GHz providers is tremendously varied, and the service promises to develop in ways we cannot predict at this time. Thus, an inflexible performance requirement might impair innovation and unnecessarily limit the types of service offerings 39 GHz licensees can provide. Permitting licensees to demonstrate that they are meeting the goals of a performance requirement with a showing tailored to their particular type of operation avoids this pitfall.[41]

Certainly, there is more than ample precedent for application of the substantial service performance test here. Indeed, the Commission has already adopted such a requirement for Part 27 licensees, at 2.3 GHz, the Upper 700 MHz band, the Lower 700 MHz band, the paired 1392-1395 MHz and 1432-1435 MHz and 1710-1755/2110-2155 MHz bands or the unpaired 1390-1392 MHz, 1670-1675 MHz and 2385-2390 MHz bands,[42] as well as 30 MHz broadband PCS licensees, 800 MHz SMR licensees (blocks A, B, and C), certain 220 MHz licensees, Location and Monitoring Service licensees, and 700 MHz public safety licensees.[43]

Exclusive-use licensees in the 3650-3700 MHz band should be afforded the same substantial service safe harbors already available to others. Hence, where a licensee offers fixed, point-to-point services, the construction of four permanent links per one million people in its

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[41] *Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands; Implementation of Section 309(j) of the Communications Act – Competitive Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz*, Report and Order and Second Notice of Proposed Rulemaking, 12 FCC Rcd 18600, 18623 (1997) ["*39 GHz Order*"].

[42] *See, e.g., Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules*, First Report and Order, 15 FCC Rcd 476, 505 (2000); *Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59)*, Report and Order, 17 FCC Rcd 1022, 1079 (2001) ["*Lower 700 MHz R&O*"]; *27 MHz R&O*, 17 FCC Rcd at 10009-11. *See also Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, Second Report and Order, Order on Reconsideration, and Fifth Notice of Proposed Rulemaking, 12 FCC Rcd 12545, 12659-61 (1997), *affirmed Melcher v. FCC*, 134 F.3d 1143, 1161-62 (D.C. Cir. 1998); *Amendments to Parts 1, 2, 87 and 101 of the Commission's Rules To License Fixed Services at 24 GHz*, Report and Order, 15 FCC Rcd 16934, 16950-52 (2000); *39 GHz Order*, 12 FCC Rcd at 18623-24; *See Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, Report and Order, 18 FCC Rcd 25162, 25192 (2003).

[43] *See Rural Wireless R&O*, 19 FCC Rcd at 19119-20.

licensed service area would constitute substantial service.[44] Where a licensee provides fixed, point-to-multipoint or mobile services, substantial service should be found where the licensee demonstrates coverage for 20 percent of the population of its licensed MSA or RSA.[45] In addition, to spur development in rural areas, the Commission should give 3650-3700 MHz band exclusive-use licensees the same right as other licensees to demonstrate substantial service via the new rural safe harbors it has recently adopted.[46] As such, a licensee should be deemed to provide substantial service where, if providing fixed service, it constructs at least one end of a permanent link in at least 20% of the "rural areas" within its licensed area.[47] Where a licensee provides mobile service, the Commission should make a finding of substantial service where it provides coverage of at least 75% of the geographic area of at least 20% of the "rural areas" within its service area.[48]

C. Licensees Should Be Permitted To Engage In Spectrum Leasing.

Under the rules adopted in the *Report and Order*, licensees in the 3650-3700 MHz band are not permitted to engage in any of the spectrum leasing activities authorized under the Commission's *Secondary Markets* proceedings.[49] WCA urges the Commission to reconsider that decision. More specifically, WCA submits that all licensees in the band should be permitted to engage in leasing under the spectrum manager model embodied at Section 1.9020 of the Commission's Rules and that licensees in the exclusive license block proposed by WCA should be

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[44] *See WCS R&O*, 12 FCC Rcd at 10843-44 (footnotes omitted).

[45] *See Lower 700 MHz R&O*, 17 FCC Rcd at 1079. *See also WCS R&O*, 12 FCC Rcd at 10844.

[46] *See Rural Wireless R&O*, 19 FCC Rcd at 19123-24.

[47] *Id.* at 19123. In this context, a "rural area" is a county whose population density is less than or equal to 100 persons per square mile. *Id.*

[48] *Id.*

[49] *See Report and Order*, 20 FCC Rcd at 6517.

permitted to engage in *de facto* transfer leasing pursuant to Sections 1.9030 and 1.9035 of the Commission's Rules.

1. All Licensees In The 3650-3700 MHz Band Should Be Permitted To Engage In Spectrum Manager Leasing.

In explaining its decision to refrain from permitting leasing of spectrum in the 3650-3700 MHz band, the Commission rationalized that leasing would be unnecessary because of its decision to issue an unlimited number of nationwide licenses and to provide no specific interference protection to deployed facilities.[50] WCA agrees that under this regulatory approach, it is difficult to envision any interest in leasing under the *de facto* transfer models of Section 1.9030 or 1.9035 – any potential lessee could secure the same rights and incur the same obligations attendant to a *de facto* transfer lease through the simple expedient of acquiring its own non-exclusive nationwide license.

However, the same cannot be said with respect to potential lessees under a spectrum manager model. Under that model, the licensee of the spectrum must retain both *de jure* and *de facto* control over the spectrum, and remains primarily responsible to the Commission for compliance with its rules and policies.[51] In other words, the lessee can make use of the spectrum to meet its business objective, but without the necessity of involving itself with the construction and operations of infrastructure, including compliance with the Commission's rules and policies. The ability to enter into a spectrum manager lease that grants a lessee access to spectrum, while keeping responsibility for regulatory compliance with the licensee, may be of tremendous benefit to some prospective lessees, particularly smaller entities that do not necessarily have the expertise necessary to efficiently assume *de facto* control over spectrum. As the Commission permits such

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[50] *Id.*

[51] *See Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets*, Report and Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd 20604, 20651-53 (2003).

leasing of capacity in other services, it should do so here. Thus, WCA urges the Commission to permit spectrum manager leasing in the 3650-3700 MHz band.

2. Licensees In The Exclusive License Block Should Be Permitted To Engage In *De Facto* Transfer Leasing.

As discussed above, WCA believes the Commission should set aside 25 MHz in the 3650-3700 MHz band for licensing on a traditional, exclusive-use basis. If it does so, it should also permit *de facto* transfer leasing within that block. A robust secondary market will contribute significantly to the Commission's goal of bringing advanced telecommunications services to all Americans and promoting increased facilities-based competition. As the Commission recently found in extending its secondary market rules to the exclusively licensed Broadband Radio Service and Educational Broadband Service:

> Facilitating the ability of [broadband service] providers to gain ready access to licensed but unused or underutilized spectrum will provide an important, efficient, and more timely means of delivering these services. Improved secondary markets also will serve our goal of enhancing competition among facilities-based providers. By adopting the leasing policies and procedures herein, we remove unnecessary regulatory constraints, lower transaction costs, and reduce spectrum acquisition costs, so as to enable more parties to enter into voluntary leasing arrangements, thus enabling more facilities-based competition by new providers. These policies provide potential lessees a ready means of obtaining access to that spectrum (in amount, location, and duration) best suited for their business needs. They also remove regulatory uncertainty . . . . Thus, these policies should facilitate the ability of licensees and potential spectrum lessees to negotiate voluntary, market-driven leasing arrangements that enable other providers or new entrants to provide facilities-based services to the public or other end-users.[52]

For the same reasons the Commission described, WCA urges the Commission to extend its flexible spectrum leasing policies to the 3650-3700 MHz band and allow both spectrum manager and *de facto* transfer leasing activity in the block subject to exclusive-use licensing.

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[52] *Id.* at 20625-26.

D. The Commission Should Revise The FSS Earth Station Interference Policy And Apply The Existing Part 101 Coordination Rules To Prospective Fixed Stations Within The 150 km Protection Zone Surrounding Grandfathered Earth Stations.

In response to interference protection concerns regarding grandfathered FSS earth stations in the 3650-3700 MHz band, the Commission created circular protection zones of 150 km around each earth station and allowed terrestrial licensees to operate within the zone only if they are able to negotiate a "mutually agree[able]" arrangement with the earth station operator.[53] WCA agrees that grandfathered earth stations warrant interference protection and does not oppose the 150 km protection zone. The *Report and Order's* negotiated entry policy, however, creates onerous transaction costs and imposes unnecessary burdens on fixed station ("FS") operators by requiring them to strike individualized arrangements with earth station licensees without a clear, objective interference protection framework. On reconsideration, the Commission should extend the well-established Part 101 coordination rules to this band, thereby providing an accepted procedure and methodology for evaluating whether a fixed station may be operated within the 150 km zone surrounding a grandfathered earth station.

As an initial matter, the Commission readily acknowledged that the 150 km protection zone "employs a high degree of worst-case conservatism that, in many instances, could result in prohibiting the use of transmitters in less-than-worst-case circumstances where, in reality, there would be no likelihood of interference to FSS earth stations."[54] Further, it noted that "a more accurate determination of the requisite separation distances" can be derived using the particular operating parameters of the FS transmitter and the earth station.[55] The *Report and Order*, however, essentially stops there. It does not adopt a coordination procedure or methodology. It

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[53] *See Report and Order*, 20 FCC Rcd at 6527.

[54] *Id*. at 6525.

[55] *Id*. at 6527.

simply mandates that the FSS station licensee must not refuse to negotiate with the fixed licensee and requires both parties to negotiate in good faith. As noted above, the transaction costs are enormously high as an FS licensee must negotiate the appropriate interference protection framework each time it seeks to place a fixed station within the protection zones of grandfathered earth stations. This approach is unnecessary and inefficient, creating significant disincentives for placement of fixed stations within the protection zone – even where the interference risk is minimal or non-existent.

The Commission should instead extend the Part 101 coordination rules to the placement of fixed stations within the protection zones. As Comsearch observed in response to the *NPRM* in this proceeding, "using the Part 101 coordination process, licensees have successfully managed interference between FS and FSS systems for over 30 years."[56] Indeed, the existing coordination approach under Part 101 has been effective for allowing thousands of fixed microwave paths and earth stations to share the 3.7-4.2 GHz and 10.7-11.7 GHz downlink bands where FS transmitters may potentially cause interference to FSS earth station receivers. There are industry accepted algorithms and procedures to quantify the interference potential when the location and operating parameters of each device is known. Despite the *Report and Order's* statement, the "detailed transmission path and link budget calculations" required for coordination are not "unduly burdensome." In any event, under the current negotiated agreement policy, fixed operators presumably would need to provide a showing to achieve agreement with the FSS operator.

The table annexed as Attachment A illustrates the coordination calculation for a hypothetical fixed service transmitter at Tysons Corner, VA, into earth station KA81 at Bren Mar (Alexandria), VA. Assuming that the fixed station is entitled to be coordinated using the same interference objectives of the earth station as would be used for a Part 101 fixed microwave

[56] Comments of Comsearch, ET Docket No. 04-151 *et al*., at 3 (filed July 28, 2004).

system, this case clears by a large margin at a distance of 15.1 km. Key components of the calculation are the significant over-the-horizon path loss calculated for the interference path based on the intervening terrain and the low EIRP allowed to the fixed service transmitter by the new rules. This illustrates that traditional coordination concepts can readily be employed to place new facilities within the 150 km FSS zones.

In sum, extending the established guidelines of Part 101 to the new 3650-3700 MHz band for coordination within the 150 km protection zones would provide up-front certainty about whether a transmitter may or may not be coordinated, greatly expediting fixed station entry without creating interference risk to grandfathered FSS earth stations.

III. CONCLUSION.

On reconsideration, WCA urges the Commission to modify its regulatory regime as described above. The interference protection components as adopted cannot provide operators with an RF environment sufficient to meet the higher level of QoS demands required by emerging broadband applications. As a result, the Commission should consider licensing a portion of the band on an exclusive-use basis, using MSA/RSA geographic areas to ensure that smaller providers have an opportunity to acquire spectrum in rural areas at reasonable cost. Those operators willing to enter the market with limited interference protections may operate on the non-exclusive portion of the band. As noted above, the Commission should increase access to this spectrum by allowing spectrum leasing and revising the FSS earth station interference protection rules to allow more

fixed and base station operations. With these actions, the Commission can take significant steps to create opportunities for investment in broadband wireless service offerings in the 3650-3700 MHz band.

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ATTACHMENT A

Example of Coordination Calculation Using Existing Method Under Part 101

Terrestrial Station	Tysons Corner	
Latitude	38-55-12.3	
Longitude	77-13-46.9	
Ground Elevation (m)	158.7	
Antenna Centerline Height (m)	50.0	
Earth Station	Bren Mar	
Call Sign	KA81	
Latitude	38-47-36.4	
Longitude	77-09-57.9	
Ground Elevation (m)	53.0	
Antenna Centerline Height (m)	6.7	
Frequency (MHz)	3675	
Base TX Power Density (W/MHz)	1.0	
Base TX Power Density (dBW/MHz)	0.0	
Interference Path Length (km)	15.1	
Interference Path Azimuth ES to TS (deg)	338.58	
ES Horizon Gain at Interference Path Azimuth (dBi)	-10.0	
Free Space Path Loss (dB)	127.3	
OH Loss Long Term/Short Term (dB)	45.7	43.0
Interference Level Long Term /Short Term (dBW/MHz)	-183.0	-180.3
ES Interference Objective Long Term/Short Term (dBW/MHz)	-156.0	-144.0
Margin Long Term / Short Term (dB)	27.0	36.3